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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHAU, LINDA N

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,747	Applicant(s) KAWAKAMI ET AL.	
	Examiner LINDA CHAU	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tezuka et al. (JP 2000-349312), in view of Katayama et al. (JP 07-213995), and further in view of Kamiya et al. (JP411269657).

Regarding claims 1 and 18-21, Tezuka teaches a stainless steel substrate, with a thickness of 20-150 μm [0021], and an insulating layer, or an inorganic-organic hybrid film, with a thickness of 0.1 nm - 5 μm , which overlaps the thickness as claimed [0011]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the optimal amounts for each of the thickness range from the substrate and the film layer to satisfy

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the equation of the condition between the substrate and the film layer in order to achieve high performance (Abstract) (Ex: $T_f: 0.5 \leq (T_s: 20) / 40$).

Further, Tezuka teaches that the insulating layer comprises a skeleton formed with a siloxane bond [0025]-[0026]. However, Tezuka fails to mention that the crosslinked oxygen of the siloxane bond is being replaced by an organic group or a hydrogen group and also fails to mention the concentration ratio between the hydrogen and the silicon. Katayama teaches a steel sheet of an inorganic-organic composite material in which the skeleton of M-O-M is substituted by O-Si(R)₂-O, which would intrinsically replace the oxygen to a organic/hydrogen group due to the hydrolyzation of an alkoxide and dialkyl dialkyoxyl silane (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's with the teachings of Katayama in order to obtain a high corrosion and heat resistant steel sheet (Abstract). Further Katayama teaches that the organic/inorganic component has a molar ratio of 8.0-0.1 (Abstract). Although Katayama doesn't specifically teach the concentration as presently claimed, it would be intrinsically clear that Katayama's concentration would encompass the concentration as claimed and that Katayama teaches similar materials as are used in the instant specification. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have Tezuka's concentration with the teachings of Katayama's concentration in order to obtain a high corrosion and heat-resistant properties (Abstract).

Furthermore, neither Tezuka nor Katayama teaches the surface roughness of the stainless steel foil substrate. Further, Kamiya teaches an inorganic-organic hybrid functional film, however, also fails to teach the surface roughness of the substrate. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's

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substrate with having at least $0.25\text{ }\mu\text{m}$, so that the inorganic-organic hybrid film can easily adhere to the textured substrate. Further, since neither Tezuka, Katayama, nor Kamiya teaches the surface roughness of the substrate, it is intrinsically clear that the surface roughness is *zero*, thereby satisfying the equation. Furthermore, discovering the workable ranges involves only routine skill in the art.

However, the recitation in the claims that the inorganic-organic hybrid film-coated stainless steel foil is “for an electrically insulating substrate material” is merely an intended use. Applicants attention is drawn to MPEP 2111.02 which states that intended use statements must be evaluated to determine whether the intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner’s position that the intended use recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art and further that the prior art structure is capable of performing the intended use. Given that Tezuka disclose stainless steel substrate with an inorganic-organic hybrid film as presently claimed, it is clear that the product of Tezuka would be capable of performing the intended use, i.e. for an electrically insulating substrate material, presently claimed as required in the above cited portion of the MPEP.

Regarding claim 2, Katayama teaches that the organic group is an alkyl group [0007].

Regarding claim 3, Tezuka and Katayama doesn’t teach the average roughness of the hybrid film. Kamiya teaches an inorganic-organic hybrid functional film having a roughness of

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0.5 nm or less [0033]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's hybrid film with the roughness taught by Kamiya, since Kamiya teaches that this will provide a smooth nature of the surface, which thus optimize the electrically insulating substrate of Tezuka.

Claims 1-3 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tezuka et al. (JP 2000-349312), in view of Yamada et al. (US 2002/0156180), and further in view of Kamiya et al. (JP411269657)

Regarding claims 1 and 18-21, Tezuka teaches a stainless steel substrate, with a thickness of 20-150 μm [0021], and an insulating layer, or an inorganic-organic hybrid film, with a thickness of 0.1 nm - 5 μm , which overlaps the thickness as claimed [0011]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the optimal amounts for each of the thickness range from the substrate and the film layer to satisfy the equation of the condition between the substrate and the film layer in order to achieve high performance (Abstract) (Ex: $T_f: 0.5 \leq (T_s: 20) / 40$).

Furthermore, Tezuka teaches that the insulating layer comprises a skeleton formed with a siloxane bond [0025]-[0026]. However, Tezuka fails to mention that the crosslinked oxygen of the siloxane bond is being replaced by an organic group or a hydrogen group and also fails to mention the concentration ratio between the hydrogen and the silicon. Yamada teaches a dielectric constant materials having a 3D network structure containing siloxane backbones wherein at least one of the crosslinked oxygens are replaced with organic groups [0010]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify

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Tezuka with the teachings of Yamada in order to obtain low moisture absorption and a low dielectric constant [0008]. Further, Yamada teaches that the molar ratio of Si bonded to hydrogen is 0.3 or greater [0037]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Tezuka with the concentration of Yamada in order to obtain a material with low moisture absorption and low dielectric constant [0008].

Tezuka, Katayama, and Kamiya don't teach the surface roughness of the stainless steel foil substrate. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's substrate with having at least $0.25\mu\text{m}$, so that the inorganic-organic hybrid film can easily adhere to the textured substrate. Further, since neither Tezuka, Yamada nor Kamiya teaches the surface roughness of the substrate, it is intrinsically clear that the surface roughness is *zero*, thereby satisfying the equation. Furthermore, discovering the workable ranges involves only routine skill in the art.

However, the recitation in the claims that the inorganic-organic hybrid film-coated stainless steel foil is "for an electrically insulating substrate material" is merely an intended use. Applicants attention is drawn to MPEP 2111.02 which states that intended use statements must be evaluated to determine whether the intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the intended use recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art and

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further that the prior art structure is capable of performing the intended use. Given that Tezuka disclose stainless steel substrate with an inorganic-organic hybrid film as presently claimed, it is clear that the product of Tezuka would be capable of performing the intended use, i.e. for an electrically insulating substrate material, presently claimed as required in the above cited portion of the MPEP.

Regarding claim 2, Yamada teaches an alkyl group as the organic group [0012].

Regarding claim 3, both Tezuka and Katayama doesn't teach the average roughness of the hybrid film. Kamiya teaches an inorganic-organic hybrid functional film having a roughness of 0.5 nm or less [0033]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's hybrid film with the roughness taught by Kamiya, since Kamiya teaches that this will provide a smooth nature of the surface, which thus optimize the electrically insulating substrate of Tezuka.

Response to Arguments

Applicant's arguments filed 10/13/09 have been fully considered but they are not persuasive.

Applicant argues that Tezuka (JP '312) does not teach or suggest that $T_f \leq T_s/40$. The examiner respectfully disagrees. Tezuka teaches a stainless steel substrate, with a thickness of 20-150 μm [0021], and an insulating layer, or an inorganic-organic hybrid film, with a thickness of 0.1 nm - 5 μm , which overlaps the thickness of the substrate and film as claimed [0011]. Applicant further argues that based on the ranges of film thickness and substrate thickness disclosed by Tezuka, Tezuka encompasses a T_f as thick as $T_s/4$, which corresponds to a film

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thickness of 5 μm and a substrate thickness of 20 μm . Indeed Tezuka teaches $T_s/4$ as argued by the applicant, however, Tezuka teaches a much broader range as set forth above. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the optimal amounts for each of the thickness range from the substrate and the film layer to satisfy the equation of the condition between the substrate and the film layer in order to achieve high performance (Abstract) (**Ex: $T_f: 0.5 \leq (T_s: 20) / 40$**).

Further, applicant argues that Katayama (JP '995) and Yamada (JP '180) fail to teach or suggest a coated stainless steel foil substrate, or the claimed combination of thickness of the film T_f , the thickness of the stainless steel foil T_s , the roughness of the foil substrate R_s , and the roughness of the hybrid film R_f . However, note that while Katayama and Yamada do not disclose all the features of the present claimed invention, both is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely the ratio of the hydrogen and silicon in a film having a cross linked oxygen silane bonding being replaced by an organic group and in combination with the primary reference, discloses the presently claimed invention.

Applicant argues that Kamiya (JP '657) does not teach or suggest the roughness of the foil substrate R_s and the thickness of the hybrid film T_f . However, Kamiya is not used to teach these limitations. However, note that while Kamiya do not disclose all the features of the present claimed invention, both is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*,

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482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely Kamiya is used to teach an inorganic-organic hybrid functional film having a roughness of 0.5 nm or less [0033]. and in combination with the primary reference, discloses the presently claimed invention. Tezuka is used to teach the thickness of the substrate and the film and the surface roughness of the substrate.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINDA CHAU whose telephone number is (571)270-5835. The examiner can normally be reached on Monday-Thursday, 8:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on (571) 272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Linda Chau
/LC/

/Holly Rickman/
Primary Examiner, Art Unit 1794